

We claim:

1. A method for inspecting a wafer, comprising:  
positioning a wafer at a fixed station;  
aligning an optical system to the wafer, wherein aligning comprises:  
5 moving the optical system as required to locate an edge of the wafer; and moving  
the optical system to follow the edge of the wafer and locate an alignment feature  
on the edge of the wafer; and  
moving the optical system relative to the wafer to inspect a plurality of  
separate inspection areas on the wafer.

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2. The method of claim 1, wherein:  
the fixed station is inside a processing apparatus; and  
the optical system views the wafer from outside the processing apparatus,  
through an optical window in the processing apparatus.

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3. The method of claim 1, further comprising:  
imaging each of the inspection areas using the optical system; and  
rotating images formed by the optical system, wherein each image is  
rotated by an amount that depends on an orientation of the wafer.

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4. The method of claim 3, wherein each image is rotate by a different  
amount according to the orientation of the optical system when the optical system  
forms the image.

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5. The method of claim 4, further comprising changing a rotation angle of  
the image from optical system while moving the optical system, wherein the  
changing is such that orientation of features in the image remain constant as the  
optical system moves.

6. The method of claim 1, wherein the optical system is mounted on a stage and moving the optical system comprises:

rotating a portion of the stage about a rotation axis of the stage until a linear axis of the stage crosses through a center of a first of the inspection areas; and

5 moving a portion of the stage along the linear axis of the stage until a distance from the rotation axis of the stage to an objective of the optical system is equal to a distance from the rotation axis of the stage to the center of the first inspection area.

10 7. The method of claim 1, wherein aligning the optical system further comprises measuring reflectance of the wafer and locating the edge of the wafer from a drop in the reflectance.

15 8. The method of claim 1, wherein after locating the alignment feature on the edge of the wafer, aligning the optical system further comprises processing an image of an area of the wafer using an image recognition module to more precisely determine the orientation of the wafer.

20 9. The method of claim 1, further comprising measuring film thickness at the plurality of inspection areas on the wafer.

10. A metrology/inspection system comprising:

a rotary stage;

a linear stage mounted on the rotary stage; and

25 an optical system mounted on the linear stage.

11. The system of claim 10, wherein the rotary stage on or near a processing apparatus; and

combined movement of the rotary and linear stage position the optical system for inspection of inspection areas on a wafer inside the processing apparatus.

- 5        12 The system of claim 10, wherein the optical system further comprises a spectrometer.

- 10        13 The system of claim 10, further comprising a command module that pre-aligns the optical system to a stationary sample, wherein pre-aligning comprises operating the rotary and linear stages to move the optical system to an edge of the sample.

14. The system of claim 13, wherein the command module identifies the edge of the sample from a drop in reflected light that the optical system measures.

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